

*Editor's Note: Bart Kosko's first Future Vision, "Heaven On A Chip," prompted such a flood of letters pro and con, delighted and baffled, that we asked Bart to write a response.*



# Chipping Away At Your Brain

**S**uppose you can load your brain into a chip. Where do you go? Do you die first? Do you stay in the brain or in the chip or in both? The mind seems to split or bifurcate in the same way that some cells split and grow as new cells. How can you be sure that it is still you in the chip? We might make a hundred copies of the chip brain. Which one is you?

The problem is that the mind in the chip does not depend on the mind in the brain. The brain can live on or die. It does not affect the chip. So how can your sense of *you* jump from brain to chip?

This is like the old mind-body split of Western philosophy. Descartes thought mind and body met in the pineal gland in your head. He still had the same problem at death as we have in the chip transfer. His soul lived in the brain and then had to hop from there to a hall in heaven or a cell in hell. Our mind has to hop from meat to chip and the chasm seems just as great.

One way to do it is to go to sleep in your brain and then wake up in the chip. In some sense you die each night when you fall asleep. You are you when you awaken because of the continuity of your memory and dreams. But how do you know that the you in the old brain did not face death? You don't. So why grow a new you somewhere if the old you still dies? Is the whole idea not to die?

I think fuzzy theory shows a way out. It holds that everything is a matter of degree. So consciousness is a matter of degree, too. You face this when you slowly fall asleep or wake up or when a drink or a bump on the head diminishes your capacity or when your thoughts soar from a shot of caffeine.

The idea is that you go from thing to not-thing in small steps just as day passes to night in degrees. There are no binary hops from thing to not-thing or from brain to not-brain (not-chip to chip).

The old idea of replacing your brain with a chip makes a binary hop. This is the source of the bifurcation. So go from brain to chip in small steps.

Picture this. The nanosurgeons open your skull and you are wide awake. You might wear virtual-reality goggles and fly as an eagle over the Rocky Mountains. Or you might watch the surgery on a monitor. At first they cut out a small gray chunk of your brain. Say it comes to 1% of your brain. You do not feel the loss or notice any change in your perceptions or memory. You are still you.

They replace your brain chunk with a tiny nanochip wrapped in sponge and studded with nanotendrils. This chiplet has the same rough input-output ports as the brain chunk had. The chiplet mimics the old brain chunk as a modern neural net might. But the chiplet runs a million times faster than the old gray matter ran and can store and process more data than all the rest of your brain combined. So you might notice a slight increase in your cognitive skills

as if you had just drunk a glass of iced tea laced with choline or norepinephrine.

Next they cut out a second brain chunk and replace it with another neural-net chiplet wrapped in a like shell of sensor-control ports. Again, there need be no break in the continuity of your consciousness. And again, you may find your mind racing a little faster and better. You might find it racing a lot faster and better. The point is that you find it that way and never lose it. You never lose *you*. Then they cut out a third brain chunk and replace it. Then they replace a fourth chunk and so on until the job is done.

Now you are not just in the chip. You are the chip or the net of chiplets. The scalpel or laser need never have broken your train of thought. You did not die, but the meat did die. Of course by then a good nanosurgeon might reverse the steps and

---

**Picture this.**

**The nanosurgeons open  
your skull and you are  
wide awake.**

---

**BY BART KOSKO**

## Chipping Away At Your Brain

*Continued from page 96*

rebuild the brain a chunk at a time. That mind would have had a big break in consciousness. But that mind is not you, so who cares.

What matters is that you can stay awake the whole time on your path to chip pseudo-immortality. The electrochemical cloud of patterns you call you need not die or dissolve if you code the patterns in a new medium. You can get out of the meat car before it wrecks.

You might want to get out of the meat car many times if you go back and forth between meat and chip. You might want to save those earlier selves so that one day you can fuzz into them for a while and see what you were once like. Then you can see if wisdom truly comes with age. ■

---

*Dr. Bart Kosko is the author of Fuzzy Thinking (Hyperion). He is on the faculty of the University of California's electrical engineering department.*

---